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EXAMINER	
GARCIA, LUIS	
ART UNIT	**PAPER NUMBER**
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/651,279	Applicant(s) HARRES, DANIEL N.
	Examiner Luis F. Garcia	Art Unit 2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26-37* is/are allowed.

6)☒ Claim(s) *1-2 and 17-19* is/are rejected.

7)☒ Claim(s) *3-16 and 20-25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *August 28, 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 17 objected to because of the following informalities: "therby" should be changed to "thereby". Appropriate correction is required.

Claim Rejections - 35 USC § 102

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Farina (US 5,515,199).

2. **Regarding claim 1**, Farina discloses a fiber optic communication system within a mobile platform, said system comprising:

a light source adapted to emit a system optical signal **(FIG. 2 (48-laser) in which the laser emits a system optical signal (e.g. Optical IN signal))**;

an electrical signal source adapted to provide a data input electrical signal **(FIG. 2 (56-RF generator) in which the RF generator (electrical signal source) is adapted to provide a generated data input electrical signal (e.g. RF IN signal))**; and a feed forward photonic modulation circuit **(FIG. 2)** adapted to receive the data input electrical signal and the system optical signal **(FIG. 2 (46-main optical circuit) in which the main optical circuit receives the RF IN signal (data input electrical signal) and the Optical IN signal (system optical signal))** and output a final modulated optical signal substantially free from residual error **(FIG. 2 (OUTPUT) and *ABSTRACT* in which the**

output modulated optical signal from the final optical coupler (72) is substantially free of non-linear distortions (residual error)).

Regarding claim 2, Farina discloses the system of Claim 1 as applied above.

Farina further discloses wherein the feed forward photonic modulation circuit comprises a first portion adapted to receive the data input electrical signal and the system optical signal **(FIG. 2 (46-main optical circuit) in which the main optical circuit (first portion) is adapted to receive the RF IN signal (data input electrical signal) and the Optical IN signal (system optical signal))**, generate a first modulated optical signal having a first wavelength **(FIG. 2 (46-main optical circuit) in which the main optical circuit outputs a generated first modulated optical signal at a first wavelength)**, and split the first modulated optical signal into a first segment and a second segment **(FIG. 2 (46-main optical circuit) in which the main optical circuit splits the first modulated optical signal into a first segment (e.g. output towards final optical coupler-72) and a second segment (e.g. output towards photodetector-65))**.

Regarding claim 17, Farina discloses a method for generating an optical signal having a high degree of linearity with respect to a data input electrical signal used to modulate the optical signal **(FIG. 2 and *ABSTRACT*)**, said method comprising: generating a first modulated optical signal using a data input electrical signal **(FIG. 2 (RF IN, 46-main optical circuit) in which the main optical circuit generates a first modulated optical signal using RF IN (data input electrical signal))**;

generating a corrective modulated signal utilizing a feed forward photonic modulation circuit **(FIG. 2 (47-correction optical circuit) and col4 ln45-57 in which the correction optical circuit generates a corrective modulated signal)**; and using the corrective modulated signal to correct for non-linearity in the first modulated optical signal utilizing the corrective modulated signal **(FIG. 2 and col4 ln45-57 in which the corrective modulated signal is used to cancel non-linear distortions (correct for non-linearity) in the first modulated optical signal)**, therby generating a final modulated optical signal having a increased degree of linearity with respect to the data input electrical signal **(FIG. 2 and col45-57 in which the final modulated optical signal (e.g output of final optical coupler-72) has significantly less nonlinear distortions (increased degree of linearity) with respect to the data input electrical signal)**.

Regarding claim 18, Farina discloses the method of Claim 17 as applied above.

Farina further discloses wherein generating the first modulated optical signal comprises:

receiving the data input electrical signal and the system optical signal at a first portion of the feed forward photonic modulation circuit **(FIG. 2 (56-RF generator, RF IN signal, 48-laser, Optical IN signal) in which the feed forward photonic modulation circuit (FIG. 2) receives the RF IN signal (data input electrical signal) and the Optical IN signal (system optical signal))**; generating the first modulated optical signal having a first wavelength **(FIG. 2 (46-main optical circuit) in which the main optical circuit (e.g. part of feed forward photonic modulation circuit) generates**

the first modulated optical signal at a first wavelength); and splitting the first modulated optical signal into a first segment and a second segment **(FIG. 2 (46-main optical circuit) in which the main optical circuit splits the first modulated optical signal into a first segment (e.g. output towards final optical coupler-72) and a second segment (e.g. output towards photodetector-65))**.

Regarding claim 19, Farina discloses the method of Claim 18 as applied above.

Farina further discloses wherein generating the first modulated optical signal having a first wavelength comprises: amplifying the data input electrical signal to a first level to produce a first amplified electrical signal **(FIG. 2 (69-amplifier) in which the electrical signal is amplified to produce an amplified electrical signal)**; and modulating the system optical signal utilizing the first amplified electrical signal to generate the first modulated optical signal **(FIG. 2 (69-amplifier) in which the amplified electrical signal is used to modulated the Optical IN signal (system optical signal) to generate a modulated optical signal)(NOTE: it is a matter of design choice that Farina only amplifies the electrical signal input into the correction optical circuit-47, for amplifying the electrical signal input into the main optical circuit-46 is within the scope of Farina's invention; thereby, insuring that an electrical input signal (e.g. RF IN) is strong enough to directly drive a modulator via help from an amplifier)**.

3. **Claim 1-2 and 17-18 are rejected** under 35 U.S.C. 102(b) as being anticipated by Gopalakrishnan (US 5,699,179).

Regarding claim 1, Gopalakrishnan discloses a fiber optic communication system within a mobile platform, said system comprising:

a light source adapted to emit a system optical signal **(FIG. 2 (202-laser) in which the laser is adapted to emit an optical signal (system optical signal))**;

an electrical signal source adapted to provide a data input electrical signal **(FIG. 2 (RF DATA SIGNAL) in which the electrical signal source (e.g. outputs RF Data Signal) is adapted to provide an RF Data Signal (input electrical signal))**; and a feed forward photonic modulation circuit **(FIG. 2)** adapted to receive the data input electrical signal and the system optical signal **(FIG. 2 (212-primary modulator) in which the primary modulator (part of feed forward photonic modulation circuit) is adapted to received the RF Data Signal (data input electrical signal) and the laser signal (system optical signal))** and output a final modulated optical signal substantially free from residual error **(FIG. 2 (Optical Data Signal) and col5 ln64-67 to col6 ln-7/col6 ln17-28 in which the optical coupler-216 outputs a final modulated optical signal which is substantially free of distortion components (residual error))**.

Regarding claim 2, Gopalakrishnan discloses the system of Claim 1 as applied above.

Gopalakrishnan further discloses wherein the feed forward photonic modulation circuit comprises a first portion adapted to receive the data input electrical signal and

the system optical signal **(FIG. 2 (212-Primary Modulator, RF Data Signal, 204-Laser output) in which the Primary Modulator (first portion) is adapted to receive the RF Data Signal (input electrical signal) and the Laser output signal (system optical signal)**), generate a first modulated optical signal having a first wavelength **(Fig. 2 (212-Primary Modulator) in which the Primary Modulator generates a first modulated signal having a first wavelength)**, and split the first modulated optical signal into a first segment and a second segment **(FIG. 2 (212-Primary Modulator) in which the Primary Modulator splits the first modulated optical signal into a first segment (e.g. first signal-214) and a second segment (e.g. second signal-240))**.

Regarding claim 17, Gopalakrishnan discloses a method for generating an optical signal having a high degree of linearity with respect to a data input electrical signal used to modulate the optical signal **(col5 ln64-67 to col6 ln-7/col6 ln17-28)**, said method comprising:

generating a first modulated optical signal using a data input electrical signal **(FIG. 2 (212-Primary Modulator, RF Data Signal) in which the Primary Modulator generates a first modulated optical signal using the RF Data Signal (data input electrical signal))**;

generating a corrective modulated signal utilizing a feed forward photonic modulation circuit **(FIG. 2 (230-Error-Correcting Modulator) in which the Error-Correcting Modulator (e.g. part of feed forward photonic modulation circuit-FIG. 2) generates a corrective modulated signal)**; and

using the corrective modulated signal to correct for non-linearity in the first modulated optical signal utilizing the corrective modulated signal **(FIG. 2 (216 coupler) and col5 ln64-67 to col6 ln-7/col6 ln17-28 in which the corrective modulated signal (e.g. output of 230) is used to correct for the distortion in the first modulated optical signal)**, therby generating a final modulated optical signal having a increased degree of linearity with respect to the data input electrical signal **(FIG. 2 (Optical Data Signal) and col5 ln64-67 to col6 ln-7/col6 ln17-28 in which a final modulated optical signal (e.g. Optical Data Signal) is generated having a decreased degree of non-linear distortions (increased degree of linearity) with respect to the RF Data Signal (data input electrical signal))**.

Regarding claim 18, Gopalakrishnan discloses the method of Claim 17 as applied above.

Gopalakrishnan further discloses wherein generating the first modulated optical signal comprises:

receiving the data input electrical signal and the system optical signal at a first portion of the feed forward photonic modulation circuit **(FIG.2 (212-Primary Modulator, RF Data Signal, 206-Laser output signal) in which the Primary Modulator (part of feed forward photonic modulation circuit-FIG. 2) receives the RF Data Signal (data input electrical signal) and the Laser output signal (system optical signal))**; generating the first modulated optical signal having a first wavelength **(FIG. 2 (212-Prmary Modulator) in which the Primary Modulator generates a first modulated optical signal at a first wavelength)**; and splitting the first modulated optical signal into

a first segment and a second segment **(FIG. 2 (212-Primary Modulator) in which the Primary modulator splits the first modulated optical signal into a first segment (e.g. signal-214) and a second segment (e.g. signal-240))**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claim 19 is rejected** under 35 U.S.C. 103(a) as being unpatentable over Gopalakrishnan in view of Kitajima et al (US 5,515,196) hereinafter referred to as Kitajima.

Regarding claim 19, Gopalakrishnan discloses the method of Claim 18 as applied above.

Gopalakrishnan does not expressly disclose wherein generating the first modulated optical signal having a first wavelength comprises: amplifying the data input electrical signal to a first level to produce a first amplified electrical signal; and modulating the system optical signal utilizing the first amplified electrical signal to generate the first modulated optical signal.

Kitajima teaches wherein generating the first modulated optical signal having a first wavelength comprises: amplifying the data input electrical signal to a first level to produce a first amplified electrical signal **(FIG. 18 (4-transmit signal generator, 14-6-**

intensity modulator driver) in which the transmit signal (data input electrical signal) is amplified by the intensity modulator driver to produce a modulator drive signal (first amplified electrical signal)); and modulating the system optical signal utilizing the first amplified electrical signal to generate the first modulated optical signal **(FIG. 18 in which the intensity driver signal (first amplified electrical signal) is used to generate the first modulated optical signal (e.g. output of intensity modulator-2-6))**.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Gopalakrishnan and incorporate Kitajima's teachings of using a modulator driver to amplify the driver data signal. The motivation being that this insures that the data drive signal is strong enough to drive the intensity modulator; thereby, allowing the system to function properly in the presence of a low level electrical data signal.

Allowable Subject Matter

5. Claims 26-37 are allowed.

Claims 4-16 and 20-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luis F. Garcia whose telephone number is (571)272-7975. The examiner can normally be reached on 8-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken N. Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LG

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER